CLAIMS

1. A process to make a conductive fluorinated polymer composition wherein :

a) an aqueous solution of an anilinium salt is mixed with an aqueous dispersion of a fluorinated polymer,

b) an oxidant for polymerizing the anilinium salt is added to the mixture of step a) to make a blend of said fluorinated polymer and resultant doped polyaniline (PANI),

c) by-products and unreacted aniline are removed by washing with water or an alcohol to obtain a blend of purified fluorinated polymer and doped PANI,

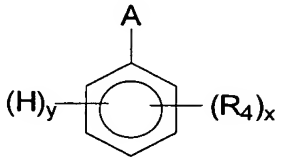
d) optionally the purified fluorinated polymer and doped PANI of step c) are mixed with an acid,

e) water is removed from the purified fluorinated polymer and doped PANI of step c) or d) if any to obtain a powder.

2. A process according to claim 1 wherein the fluorinated polymer is selected from the group consisting of vinylidene fluoride (VF2) homopolymers and copolymers containing at least 50% by weight of VF2, the copolymer being chosen from chlorotrifluoroethylene (CTFE), hexafluoropropylene (HFP), trifluoroethylene (VF3) and tetrafluoroethylene (TFE).

3. A process according to claim 1 wherein the anilinium salt is produced by reacting an aniline with an acid selected from the group consisting of acids of formula (2) $A—R_3$

and (3)



wherein: A is sulfonic acid, selenic acid, phosphonic acid or a carboxylic acid group; or hydrogen sulfate, hydrogen selenate, hydrogen phosphate;

x is an integer from 0 to 5;

y is an integer from 0 to 4 with the proviso that the sum of x and y is 5;

R_3 is alkyl, alkenyl, alkoxy, alkanoyl, alkylthio, alkylthioalkyl, having from 1 to about 20 carbon atoms; or alkylaryl, arylalkyl, alkylsulfinyl, alkoxyalkyl, alkylsulfonyl, alkoxycarbonyl, carboxylic acid, where the alkyl or alkoxy has from 0 to about 20 carbon atoms; or alkyl having from 3 to about 20 carbon atoms substituted with one or more sulfonic acid, carboxylic acid, halogen, nitro, cyano, diazo, or epoxy moieties; or a substituted or unsubstituted 3, 4, 5, 6 or 7 membered aromatic or alicyclic carbon ring, which ring may include one or more divalent heteroatoms of nitrogen, sulfur, sulfinyl, sulfonyl or oxygen such as thiophenyl, pyrolyl, furanyl, pyridinyl.

In addition to these monomeric acid forms, R_3 can be a polymeric backbone from which depend a plurality of acid functions "A." Examples of polymeric acids include sulfonated polystyrene, sulfonated polyethylene and the like. In these cases the polymer backbone should be selected to be soluble in the nonpolar organic solvent (plasticizer) such that highly polar polymers, for example polyacrylic acid or poly(vinylsulfonate) or the like, are usually not preferred.

R_4 is the same or different at each occurrence and is alkyl, alkenyl, alkoxy, cycloalkyl, cycloalkenyl, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylaryl, arylalkyl, alkylsulfinyl, alkoxyalkyl, alkylsulfonyl, aryl, arylthio, arylsulfinyl, alkoxycarbonyl, arylsulfonyl, carboxylic acid, halogen, cyano, or alkyl substituted with one or more sulfonic acid, carboxylic acid, halogen, nitro, cyano, diazo or epoxy moieties; or any two R substituents taken together are an alkylene or alkenylene group completing a 3, 4, 5, 6 or 7 membered aromatic or alicyclic carbon ring or multiples thereof, which ring or rings may include one or more divalent heteroatoms of nitrogen, sulfur, sulfinyl, sulfonyl or oxygen. R_4

typically has from about 1 to about 20 carbons especially 3 to 20 and more especially from about 8 to 20 carbons.

4. A process according to claim 1 wherein the oxidant is selected from the group consisting of ammonium persulfate, potassium persulfate or sodium persulfate.

5. A process according to claim 3, comprising step (d) and wherein the acid in step d) is the same as the one used to make the anilinium salt of step a).

6. A process according to claim 1, further comprising melting and shaping the powder of step e).

7. A process according to claim 3, wherein the oxidant is selected from the group consisting of ammonium persulfate, potassium persulfate or sodium persulfate.

8. In a process for producing a conductive fluorinated polymer composition, the steps wherein:

a) an aqueous solution of an anilinium salt is mixed with an aqueous dispersion of a fluorinated polymer,

b) an oxidant for polymerizing the anilinium salt is added to the mixture of step a) to make a blend of said fluorinated polymer and resultant doped polyaniline (PANI).

9. A process according to claim 1, wherein the oxidant is water-soluble.

10. A process according to claim 8, wherein the oxidant is water-soluble.

11. A process according to claim 10, wherein the oxidant is selected from the group consisting of ammonium persulfate, potassium persulfate or sodium persulfate.